

Rural Illinois *High Speed Connectivity* Technology Development Study

Final Report

June 2002



**Office of Economic and
Regional Development**

Southern Illinois University Carbondale

Overview

This report describes the findings of an April 2002 measurement of Internet service availability and usage among rural Illinois households and small businesses. The findings are reported within the context of federal, state, and private-sector deliberations on how to speed deployment of broadband technology to underserved populations.

Current Indicators of Deployment in Rural Illinois

Digital Subscriber Lines (DSL). Many Illinois local exchange carriers are offering or plan to offer DSL connections in parts of their service areas. Many are advertising DSL offerings, but are advising their customers that DSL services are not available in all areas. This report includes a list of Illinois local exchange carriers (LEC) and their broadband offerings.

Cable Modem. Cable TV providers advertise that high-speed Internet service is among their offerings, but a customer must contact the provider's customer service office before knowing whether the service extends to their home or business. Cable service is not available in remote areas of rural Illinois.

Wireless. Eight percent of Internet service providers serving Illinois communities outside the Chicago area provide wireless Internet service. All but one percent offer Internet services through dial-up connections, and 42 percent are offering DSL or cable connections.

Internet Use Patterns and Adoption Rates of Rural Illinoisans

Households. Age is a factor that appears to affect adoption rates. Of heads of rural Illinois households who are 55 and older, 29 percent have a personal computer in their home, whereas 71 percent of heads of household younger than 55 have a personal computer. Among over-age-55 respondents who have a computer, a lower percentage is connected to the Internet than that of each of the younger age groups.

Twenty-seven percent of rural Illinoisans who have a dial-up connection also have the option to purchase high speed, but have chosen not to. Among those, almost two-thirds cite high costs as the reason they have not switched.

On-line activities differ among age groups. A larger percentage of respondents over age 55 reported buying and selling stock on-line,

researching information about their personal finances, researching prices, and researching health information, than the 55-and-younger respondents.

Small businesses. Seventy-two percent of rural Illinois small businesses have one or more working computer at their business. Of those, 73 percent have at least one computer at their business that is connected to the Internet. Forty percent have more than one computer connected to the Internet.

Of rural Illinois small businesses connected to the Internet, 27 percent have a high-speed connection and 75 percent have a dial-up connection (Thirteen respondents have more than one type of connection). Thirty-eight percent of dial-up respondents who could purchase high-speed service have chosen not to for their business. Of those, 62 percent have never experienced a high-speed Internet connection.

Of on-line businesses, only 28 percent are selling their products and/or services through a web site, but 64 percent are corresponding with their customers and suppliers via e-mail, and 55 percent are purchasing supplies and equipment on-line.

Recommendations

Continue to Educate Consumers

The Illinois Century Network is creating high-speed Internet access points where rural residents can become familiar with the educational, social, and economic advantages of the information superhighway. These public schools, libraries, community colleges, universities, and museums can be used to introduce communities to advanced services, if combined with programming that is meaningful to their residents and business people.

The development and offering of training programs that fit the specific needs and interests of a particular community can stimulate the weak interest identified in the survey of rural Illinois households and small businesses.

As young people experience broadband in their schools, they can be recruited to share what they have learned with others in their communities.

Businesses can sponsor internship programs for college students (studying information systems technologies and management information systems) to train business owners, managers, and employees on e-business applications that will allow them to become more productive and competitive.

Encourage Communities to be Proactive

There are many examples of communities that have successfully acquired broadband service for their area. Digital Divide funding should be set aside to

assist or support community-initiated needs assessments, strategy/planning development, and implementation.

Continue to Monitor Availability and Adoption

The progress of deployment and adoption of broadband Internet services in rural Illinois is subject to many influences: demographics, the economic strength of the providers serving the area, new technologies that make it easier to reach remote areas, new applications that stimulate demand, the educational and economic development objectives of a community, and the community's capacity to organize and solve problems.

Today's assessment of the rural Illinois broadband market most likely will be outdated in less than a year. In order to keep programs and policies effective, policy makers and providers must have regular, up-to-date assessments of availability and demand.

This study includes an informal assessment of broadband services of rural providers. A more thorough, baseline measurement of provider offerings is recommended, with yearly follow-up surveys to coincide with follow-up consumer studies.

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The author would like to thank Nikki Nance and Kyle Harfst of SIUC Office of Economic and Regional Development for contributing their technical and statistical expertise toward the completion of this project.

Introduction

The Telecommunications Act of 1996 directed the Federal Communications Commission (FCC) and the states to encourage deployment of advanced telecommunications capability to all Americans on a reasonable and timely basis. As recently as June 2002, the President reiterated the need for full deployment of high-speed Internet services, with a promise of additional support for FCC efforts.

The U.S. has fallen to tenth in the world in market penetration of high-speed Internet services—behind South Korea, Hong Kong, Taiwan, and Canada, to name a few (Point Topic Ltd. 2002). Within U.S. borders, the broadband digital information superhighway has become a powerful channel for commerce and communication in large metropolitan markets. Yet, many of our rural communities are still waiting for the technology to reach them.

In its third progress report on deployment of advanced telecommunications services, the FCC states:

...the Commission identified several groups of consumers as being particularly vulnerable, including low-income consumers, those living in sparsely-populated areas, minority consumers, consumers living on tribal lands, persons with disabilities, and those living in the U.S. territories (FCC, February 2002).

The lag in availability to sparsely populated areas adds to factors aggravating weak rural economies. Rural businesses stand to lose local customers to on-line vendors, sending revenue out of the community. Rural communities without access to broadband-dependent educational and entertainment applications have difficulty attracting new businesses and retaining a young, well-educated workforce. Advanced information technologies have the potential to reduce rural disadvantages of distance and smaller market sizes and to level the competitive playing field between urban and rural businesses.

What approaches are appropriate for rural Illinois at this point in time? The FCC maintains that, where effective, market forces should be allowed to drive the progression of advanced services into new markets.

Although regulators can play an important role in educating consumers about the availability and capability of advanced services, consumers and service providers, interacting in the marketplace, are ultimately best suited to determine how and when advanced services should be produced and purchased. Consumer responses to advanced services applications and technologies are continuing to evolve, and we believe that market

participants should resolve challenges through technological innovations, marketing, creative financing and other skills (FCC, February 2002).

This study seeks to inform approaches to encouraging deployment in underserved areas of rural Illinois by providing a current picture of rural consumer responses to advanced services applications and technologies.

Background

Most households with phone service have Internet service available to them through their phone line (a dial-up connection). However, unless they purchase a second phone line, they can't make or receive phone calls while using their dial-up Internet connection. In some areas, they must pay a fee for the number of minutes they are on-line.

These dial-up connections are sufficient for e-mail and slow web surfing. However the connections are too slow and narrow to accommodate newer and larger applications, such as streaming video, online gaming, immediate stock and news updates, large file downloads, movies, and interactive distance learning.

In contrast, a broadband Internet connection is faster, allows for more and speedier data transfer, is always on, and does not require an extra phone line.

Capability of Dial-Up and High-Speed Connections

Applications/Features	Dial-Up Connection at 56 kbps.	High-Speed Connection at 1.5 to 10 mbps
Always on	No	Yes
E-mail	Yes	Yes
Time to download a 10 mb file	1 hour	10 sec. to 1 min.
Web surfing	Slow	Fast
Streaming Video	No	Yes
Video conferencing	No	Yes
Immediate Stock/News Updates	No	Yes
On-line gaming	No	Yes
On-line interactive classes	No	Yes

(Talamon Corporation 2001)

At this point in the evolution of advanced Internet technology, the technologies competing for the high-speed market are 1) digital subscriber lines, 2) cable modem, and 3) wireless Internet service. The FCC tracks the overall number of lines of all the high-speed technologies as having increased by 249 percent between December 1999 and June 2001.

High Speed Lines* in the U.S.

Types of Technology	Dec 1999	June 2000	Dec 2000	June 2001	Percent Change Dec 1999- June 2001
DSL and other Wireline	979,701	1,710,177	2,998,392	3,781,900	286%
Coaxial Cable	1,411,977	2,284,491	3,582,874	5,184,141	267%
Fiber	312,204	307,151	376,203	455,593	45%
Satellite or Fixed Wireless	50,404	65,615	112,405	194,707	286%
Total Lines	2,754,286	4,367,434	7,069,874	9,616,341	249%
*(Over 200 kbps in at least one direction) (FCC February 2002)					

At this time, DSL and cable modem Internet technology are proving more difficult to deploy in remote rural areas than fixed wireless and satellite service. Several factors account for the disparity between deployment levels to rural and urban markets. In urban areas, deployment is driven by competition for dense, eager broadband markets. In rural areas, weak demand and the comparatively high cost of deployment are discouraging competition. Lines must be laid and upgraded over longer distances, and there are fewer customers along the lines to pay for the services.

Following is a compilation of the features and availability rural communities should consider when pursuing advanced Internet service.

Comparative Features and Advantages of Various Broadband Technologies

Technology	Definition	Availability	Monthly Cost to Customer	Value for the price
Residential DSL (ADSL)	DSL (digital subscriber line) is a method for moving data over regular phone lines. A DSL circuit is much faster than a regular phone connection, and the wires coming into the subscriber's premises are the same (copper) wires used for regular phone service. Asymmetrical digital subscriber line (ADSL) provides higher download speed than upload.	Available in medium and large cities. Rarely available in rural areas. Where available, customer must be within 18,000 feet (or around three miles) from telephone switching office.	Installation: free to \$200. Equipment: free to \$200. Monthly fee: about \$50.	Moderate speed, low cost, reliable. Value drops as distance from central office increases.
Business DSL (SDSL)	Symmetrical digital subscriber line (SDSL) provides equal download and upload speeds.	Available in medium and large cities. Rarely available in rural areas. Where available, customer must be within 18,000 feet from telephone switching office.	Installation: about \$300. Equipment: from several hundred to several thousand dollars. Monthly fee: about \$100 to \$400.	High speed, high cost, reliable. Value drops as distance from central office increases.

Comparative Features and Advantages of Various Broadband Technologies

Technology	Definition	Availability	Monthly Cost to Customer	Value for the price
Cable	Cable modem uses the same cables that carry cable TV signals to carry data. Cable modem service can be purchased as a stand-alone service or as an add-on to one's current cable TV service. If many people in a neighborhood are using their cable modems at once, the connection speed may drop considerably.	Available in many markets where cable TV service is available. Not available in remote rural areas.	Installation: free to \$200. Equipment: free to \$200. Monthly fee: \$30 to \$60.	High speed, low cost. Speed depends on number of active users in the neighborhood. Cable modem service is a good choice if there aren't too many other cable modem users in your area and if you want a system that's easy to set up and maintain.
One-way satellite	Satellite broadband uses a dish on your house or building to send and receive data from satellites orbiting the Earth. The same dish may be used for satellite TV, depending on the service provider's offering. One-way satellite communication equipment requires the use of a phone modem connection to send data to the broadband provider; this results in additional costs and slower speed.	Available anywhere in the continental U.S. where you can get a phone line and set up a dish to face south.	Installation: up to \$200. Equipment: up to \$150. Monthly fee: \$30 to \$50.	Moderate speed, low cost, limited applications, sometimes unreliable due to bad weather, local interference, or a misaligned dish. Satellite isn't as fast or reliable as DSL or cable, but definitely better than dialup.
Two-way satellite	Satellite Internet access allows for high-speed data transfers from the Internet to your computer via a satellite orbiting the earth. Two-way satellite technology allows data to be sent through satellite both downstream and upstream	Available anywhere in the continental U.S. where you can set up a dish to face south.	Installation: up to \$200. Equipment: up to \$500. Monthly fee: \$50 to \$70.	Moderate speed, moderate cost, faster and more reliable than one-way satellite.
Fixed Wireless	Wireless broadband uses an antenna placed on or in your building to send and receive data. The data is transmitted over a wireless network, which consists of antenna towers placed three to five miles apart. The connection speed is not limited by your distance from the wireless antenna or by the number of wireless users in your area. Wireless' speed is currently comparable to ADSL; however, the theoretical maximum is much higher, so you can expect the speed of wireless connections to increase in coming years.	Available in limited areas but expanding.	Equipment: up to \$300. Monthly fee: \$50 to \$80.	High speed, moderate cost, reliable.

SOURCE: <http://ibuybroaband.com>

Current Indications of Deployment in Rural Illinois

The number of high-speed lines in the U.S. increased by 249% between December 1999 and June 2001. The FCC reports that 98 percent of the nation's most densely populated zip codes have at least one high-speed subscriber (FCC 2002).

At the same time, only 37 percent of our nation's least populated zip codes (fewer than 6 people per square mile) report high-speed service. Nonetheless, this is an 85 percent increase over the FCC's December 1999 measurement (FCC 2002).

Availability of DSL in Rural Illinois

As of December 2001, about 48 percent of the lines of all U.S. incumbent local exchange carriers¹ (ILECs) were DSL equipped. Many Illinois local exchange carriers are offering or plan to offer DSL connections in parts of their service areas.

An informal review of the promotional web sites of local exchange carriers serving rural Illinois shows that many are advertising DSL offerings, but are advising their customers that DSL services are not available in all areas. (See appendix for map of LEC territories.)

High-Speed Technology Availability Among LEC's Serving Rural Illinois*			
RURAL ILLINOIS PROVIDER	PROVIDER'S TERRITORY	HIGH-SPEED OFFERINGS	AREAS WHERE HIGH-SPEED IS AVAILABLE
ADAMS TELEPHONE COOPERATIVE Golden, IL 62339 http://www.adams.net/ Adams County	Territory just north and east of Quincy. Augusta, Chambersburg, Coatsburg, Fishhook, Golden, Hersman, Lima, Loraine, Mendon, Meyer, Mindale, Plymouth, Ursa	DSL. Company web page posts DSL offerings. Price and areas of availability not specified (< http://www.adams.net/ > 6/13/02).	Areas of availability unknown.
AMERITECH http://www.ameritech.com	Serves mostly metropolitan areas. See colored map attached or at < http://www.icc.state.il.us/icc/tc/docs/lecmap.pdf >.	DSL starting at \$49.95 (< http://www.ameritech.com > 6/14/02).	This service is currently available in select areas of Indiana, Detroit, Ohio, Wisconsin, metropolitan Chicago, and to 16,000 homes and small businesses in Kankakee, Illinois (< http://www.ameritech.com > 6/14/02).
C-R TELEPHONE COMPANY Cornell, IL 61319 http://www.crtelco.net Livingston County	Cornell and Ransom townships in Livingston County	DSL starting at \$59.95	C-R DSL services the towns of Cornell and Ransom. However, you currently must reside within 3 miles of the office. (< http://www.crtelco.net > 6/14/02)

High-Speed Technology Availability Among LEC's Serving Rural Illinois*

RURAL ILLINOIS PROVIDER	PROVIDER'S TERRITORY	HIGH-SPEED OFFERINGS	AREAS WHERE HIGH-SPEED IS AVAILABLE
CASS TELEPHONE COMPANY Virginia, IL 62691 http://www.casscomm.com Cass County	Ashland, Chandlerville, Easton, Virginia	Web site posts both cable modem and DSL offerings. Cable modem @ \$39.95 residential, \$99.95 commercial. DSL prices not specified.	According to web site 6/13/02, "Cass Cable T.V. is now offering high speed DSL Internet service in certain rural areas around Virginia, Ashland, & Chandlerville." Web site does not indicate where cable modem connections are offered (< http://www.casscomm.com > 6/17/02).
EL PASO TELEPHONE COMPANY El Paso, IL 61738 http://www.elpaso.net Woodford County	El Paso, Kappa, Panola	DSL (El Paso only) starting at \$59.95	El Paso only (< http://www.elpaso.net > 6/17/02).
ESSEX TELCOM, INC. Sterling, IL 61081 http://www.essextelco.com Whiteside County	Amboy, Ashton, Chadwick, Coleta, Creston, DeKalb, Dixon, Franklin Grove, Fulton, Genoa, Grand Detour, Harmon, Hinckley, Hooppole, Kirkland, Lanark, Leaf River, Lyndon, Malta, Maple Park, Milledgeville, Monroe Center, Morrison, Mt. Carroll, Mt. Morris, Nelson, Oregon, Polo, Prophetstown, Rochelle, Savanna, Shannon, Sterling, Steward, Sublette, Sycamore, Tampico, Thomas, Waterman, Freeport	Plans to offer DSL in the future (< http://www.essextelco.com > 6/17/02).	
FRONTIER COMMUNICATION INC. Mt. Pulaski, IL 62548-1156 www.frontiercorp.com	See colored map attached or at < http://www.icc.state.il.us/icc/tc/docs/lecmap.pdf >.	DSL . Company web page posts DSL offerings. Price and areas of availability not specified (6/13/02).	Areas of availability not specified (< http://www.frontiercorp.com > 6/13/02).
GALLATIN RIVER TELEPHONE CO. Galesburg, IL 61401 www.gallatinriver.com Knox County	Avon, Cameron, Dixon, Forest City, Galesburg, Grand Detour, Green Valley, Harmon, Havana, Knoxville, Lacon, Mount Carroll, Nelson, North Pekin, Pekin, Savanna, South Pekin, Talbott, Thompson, Topeka, Wataga	DSL @ \$52.95/bundled with long distance and add-ons, e.g., caller id, waiting, etc.	Areas of availability not specified (< http://www.frontiercorp.com > 6/13/02).
GRAFTON TELEPHONE COMPANY Grafton, IL 62037 www.gtec.com Jersey County	Jerseyville	Plans to offer DSL and wireless in the future (< http://www.gtec.com > 6/17/02).	

High-Speed Technology Availability Among LEC's Serving Rural Illinois*

RURAL ILLINOIS PROVIDER	PROVIDER'S TERRITORY	HIGH-SPEED OFFERINGS	AREAS WHERE HIGH-SPEED IS AVAILABLE
GRIDLEY TELEPHONE COMPANY Gridley, IL 61744-0129 www.gridtel.com McLean Co.	McLean and Livingston Counties	DSL. Company web page posts DSL offerings. Price and areas of availability not specified (6/13/02).	Areas of availability not specified (< http://www.gridtel.com > 6/13/02).
HARRISONVILLE TELEPHONE COMPANY Waterloo, IL 62298-0149 www.htc.net Monroe County	Columbia, Dupo, Prairie du Rocher, Red Bud, Renault, Valmeyer, Waterloo	DSL starting at \$47.95 if purchased with long distance service.	According to company web site, DSL "in the Columbia, Dupo, Maeystown, Prairie du Rocher, Red Bud, Valmeyer and Waterloo areas. Remaining Harrisonville Telephone Company areas will be served in the near future. To be eligible for HTC ExpressNet service, a customer's physical phone line connection must be within 18,000 feet of a Harrisonville Telephone Company Central Switching Office" (< http://www.htc.net > 6/17/02).
HENRY COUNTY TELEPHONE COMPANY Geneseo, IL 61254 www.geneseo.com	Annawan, Atkinson	DSL starting at \$49.95. Must be within 18,000 cable feet of a telephone company switch that offers DSL service.	Must be within 18,000 cable feet of a telephone company switch that offers DSL service (< http://www.geneseo.com > 6/17/02).
HOME TELEPHONE COMPANY St. Jacob, IL 62281 www.hometel.com Madison County	Highland and St. Jacob	DSL starting at \$29.95	According to company web site, available in Highland and St. Jacob (< http://www.hometel.com > 6/17/02).
ILLINOIS CONSOLIDATED TELEPHONE COMPANY Mattoon, IL 61938 www.illinoisconsolidated.com Coles County	Arcola, Arthur, Ashmore, Assumption, Atwood, Blue Mound, Charleston, Cowden, Edinburg, Effingham, Farmersville, Gays, Hillsboro, Humboldt, Irving, Kincaid, Litchfield, Martinsville, Mattoon, Morrisonville, Mt. Auburn, Nokomis, Oakland, Oblong, Owaneco, Pana, Raymond, Shelbyville, Sigel, Stewardson, Stonington, Strasburg, Taylorville, Tower Hill, Westervelt, Windsor, Witt	DSL starting at \$49.95.	"We are currently serving all or part of the following communities: Arcola, Arthur, Ashmore, Assumption, Atwood, Blue Mound, Charleston, Edinburg, Effingham, Farmersville, Hillsboro, Kincaid, Litchfield, Mattoon, Morrisonville, Nokomis, Oakland, Pana, Raymond, Shelbyville, Sigel, Stonington, Stewardson, Taylorville, Tower Hill, Windsor, Witt" (< http://www.illinoisconsolidated.com > 6/12/02).
MADISON RIVER COMMUNICATIONS L.L.C. GALLATIN RIVER INTEGRATED COMMUNICATIONS SOLUTIONS Galesburg, IL 61401 www.odintelco.com Knox County	Savanna, Mt. Carroll, Thomson, Galesburg, Knoxville, Wataga, Cameron, Avon, Dixon, Grand Detour, Harmon, Forest City	DSL @ \$52.95. DSL not available in all areas.	DSL not available in all areas (< http://www.grics.com > 6/17/02).

High-Speed Technology Availability Among LEC's Serving Rural Illinois*

RURAL ILLINOIS PROVIDER	PROVIDER'S TERRITORY	HIGH-SPEED OFFERINGS	AREAS WHERE HIGH-SPEED IS AVAILABLE
MARSEILLES TELEPHONE COMPANY Metamora, IL 61548-0800 http://www.mtco.com/ Woodford County	Marseilles	DSL starting at \$39.95.	DSL available in Germantown Hills, Marseilles, Metamora, Morton. Now Available In Peoria, Bartonville, East Peoria (http://www.mtco.com/ > 6/17/02).
ODIN TELEPHONE EXCHANGE, INC. Odin, IL 62870 www.odintelco.com Marion County	Odin, Shobonie	DSL	According to company web site, "At this time, DSL will be guaranteed to work at 256K up to three miles from the OTE Communications office. For customers living further than this three mile limit, we must first test your line to see if we can support DSL service to your location" (http://www.odintelco.com > 6/13/02).
VERIZON Bloomington, IL 61701 www.verizon.com	See colored map attached or at < http://www.icc.state.il.us/icc/tc/docs/lecmap.pdf >.	DSL starting at \$29.95 Wireless (Mobile Web Plus) starting at \$9.95.	DSL availability query on company's web page doesn't work (6/14/02). Wireless (Mobile Web Plus) available in Bloomington, Champaign, Chicago, Clinton, Danville, Decatur, Lincoln, Litchfield, Normal, Rantoul, Springfield, Urbana (www.verizon.com > 6/17/02).

* This information may not be comprehensive. It was obtained by reviewing, (between June 10 and 17, 2002) the web sites of Illinois local exchange carriers (LECs). The list of Illinois LECs was obtained from the Illinois Commerce Commission web site at <<http://www.icc.state.il.us/icc/home/tc.asp>>, which was last revised 10/01/01. A map of Illinois LEC exchange area boundaries is included in the Appendix of this report.

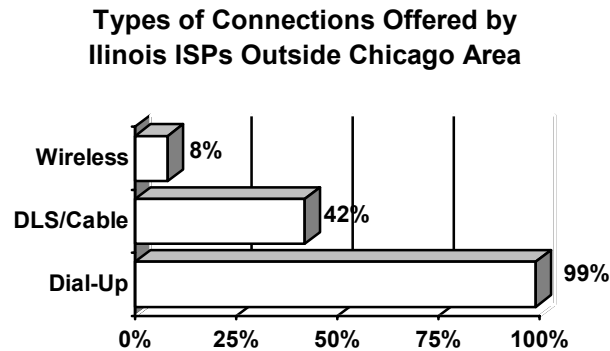
Availability of Cable Modem in Rural Illinois

Current promotional information about the availability of cable modem Internet access in rural Illinois is inconclusive. Providers advertise that high-speed Internet service is among their offerings, but a customer must contact the provider's customer service office before knowing whether the service extends to their home or business. Recent mergers between cable TV and broadband companies promise to advance the deployment of cable modem Internet service in existing cable TV markets. Cable TV is still not available in remote rural areas.

Availability of Fixed Wireless in Rural Illinois

During the first half of 2001, growth of wireless Internet services outpaced that of all other technologies. Many Internet service providers² (ISP) are adding or planning to add fixed wireless and/or satellite access in order to reach rural markets (Wagner 2002).

A June 2002 analysis of a commercial on-line inventory of ISPs reveals that eight percent of Internet service providers serving Illinois communities outside the Chicago area provide wireless Internet service (The List Web Host 2002).



The National Regulatory Research Institute conducts an on-line survey of communities that have acquired broadband services. Of the eleven responding communities in Illinois that have acquired Internet service since 1999, nine of the communities describe their region as rural and/or remote. Eight of the communities procured fixed wireless Internet service, rather than satellite, DSL, or cable. Eight used private funding to purchase the equipment. Five of the communities reported that their new services would be serving less than 10,000 customers, and four communities of less than 1,000.

So, the demand is there and some communities are not waiting for the telephone and cable companies to bring services to them.

¹ Incumbent local exchange carriers (ILECs) are owners of existing telecommunication facilities. Competitive local exchange carriers (CLECs) obtain access to incumbent local exchange carrier facilities (central office co-location space and their lines running from there to each subscriber) to provide broadband using DSL.

² An Internet Service Provider (ISP) provides Internet service to consumers. Most ISPs distribute Internet service using the facilities (e.g., copper wire, cable, bandwidth transmissions) of telecommunication providers. Many ISPs offer companion services, such as web hosting and technical support.

Rural Illinois Internet User Profile

A poll, conducted for this study in April 2002, interviewed 800 randomly selected rural Illinois heads of household and 250 small businesses to assess Internet use patterns and adoption rates.

The 800 rural Illinois household interviews were obtained by random digit dialing of a sample of 16,000 households situated outside metropolitan statistical areas. The 250 rural Illinois small business interviews were obtained by random digit dialing of a sample of 3,000 small businesses, with 20 or fewer employees, and situated outside metropolitan statistical areas.

Following are the main findings of the surveys. A full account of the results of each survey can be found in the Appendix.

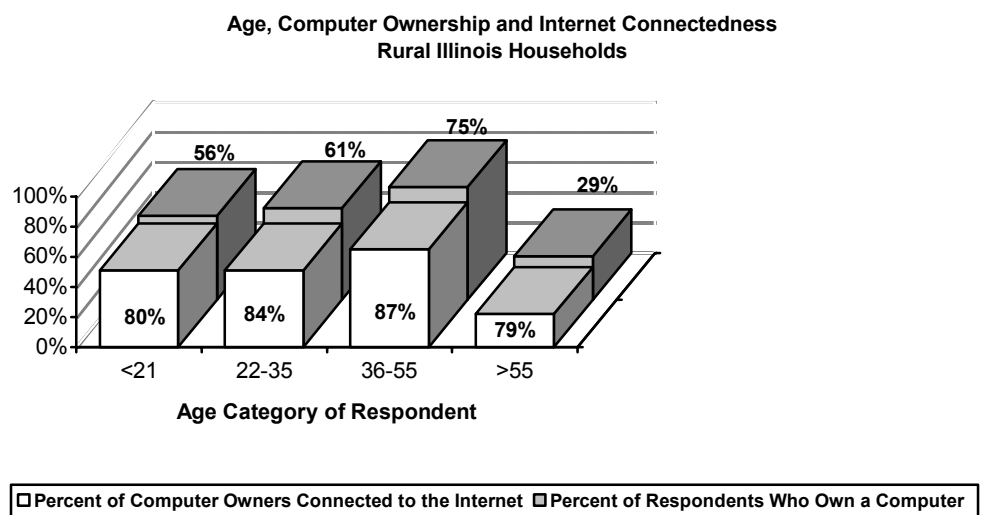
Household Internet Adoption Rates

Survey results show rural Illinois is keeping pace with the rest of the nation in adopting Internet technology. Fifty-one percent of rural Illinois households have a personal computer (Appendix C, #1). Of those with a computer, 83 percent are connected to the Internet (Appendix C, #5) and of those, 11.4 percent are high-speed subscribers (Appendix C, #11).

Age and Adoption Rates

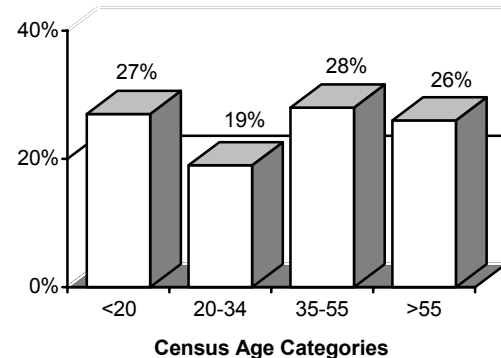
Age is a factor that appears to affect adoption rates. Of heads of rural Illinois households who are 55 and older, 29 percent have a personal computer in their home, whereas 71 percent of heads of household younger than 55 have a personal computer.

Among over-age-55 respondents who have a computer, a lower percentage is connected to the Internet than that of each of the younger age groups.



Forty-five percent of the household survey respondents are over age 55. This high percentage is most likely due to the fact that interviewers asked for heads of household to respond to the survey questions. In contrast, year 2000 Census figures show that, of all people in the study area, only 26 percent are over age 55.

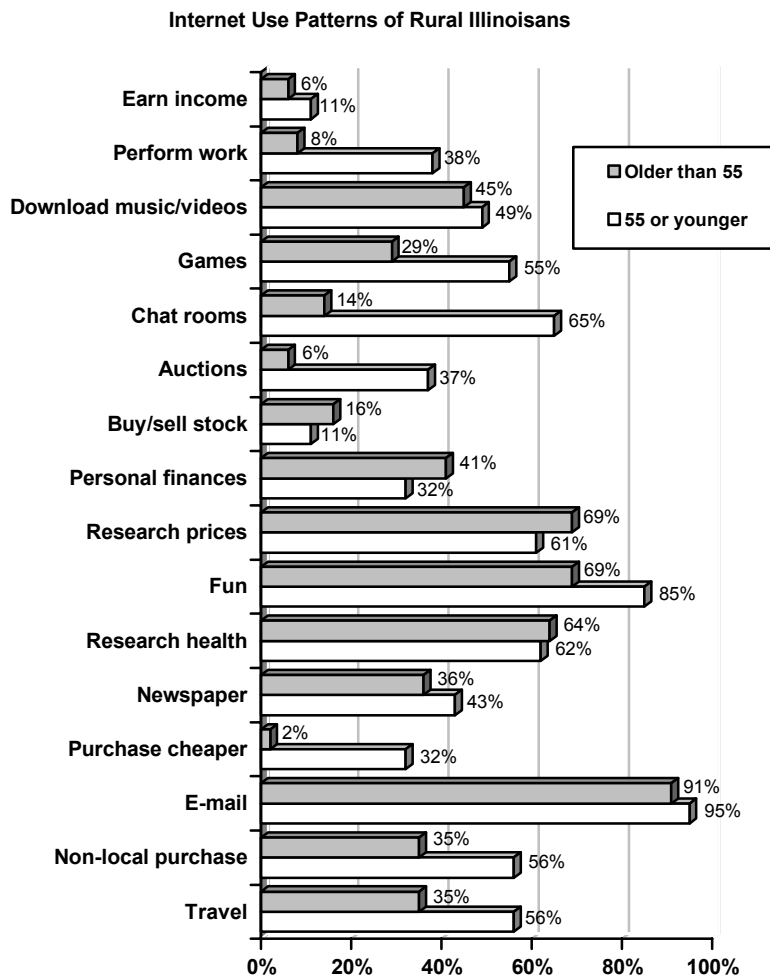
**Age Profile of Rural Illinoisans
U.S. Census**



Household Internet Use Patterns

Rural Illinois households are on-line an average of 13.7 hours per week (Appendix C, #9). Among all respondents, the three most-reported on-line activities are sending and receiving e-mail (93 percent), searching the Internet for fun (81 percent), and playing computer games on-line (79 percent).

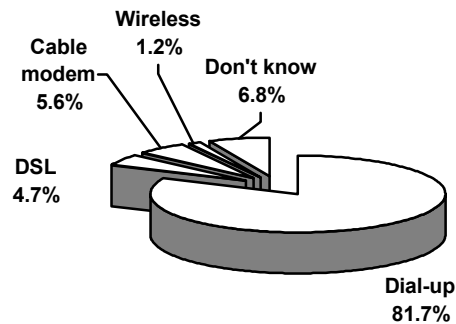
Use patterns differ among age groups, though. A larger percentage of respondents over age 55 reported buying and selling stock on-line,



researching information about their personal finances, researching prices, and researching health information, than the 55-and-younger respondents. The 55-and-younger respondents are more likely to perform work for their employer, play computer games, communicate through chat rooms, place bids at on-line auctions, surf for fun, make purchases, and make travel arrangements on-line, than those over age 55.

Household Internet Technology

Among on-line respondents, 81.7 percent have a dial-up connection, 5.6 percent have cable modem, 4.7 percent have DSL, and 1.2 percent wireless.

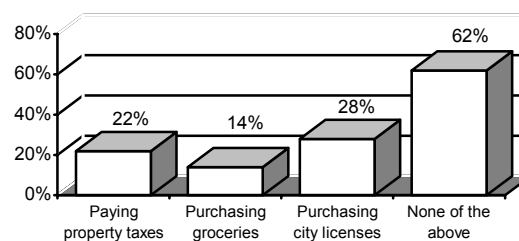


Household Demand

This study shows that 27 percent of rural Illinoisans who have a dial-up connection also have the option to purchase high speed, but have chosen not to. Among those, almost two thirds cite high costs as the reason they have not switched (Appendix C, #19).

Interest in using the Internet to conduct business appears weak among the respondents. More than half of on-line respondents said they are not interested in conducting routine grocery shopping, paying property taxes, and purchasing city licenses on-line.

If the following services were available on-line, would you consider regularly using them?

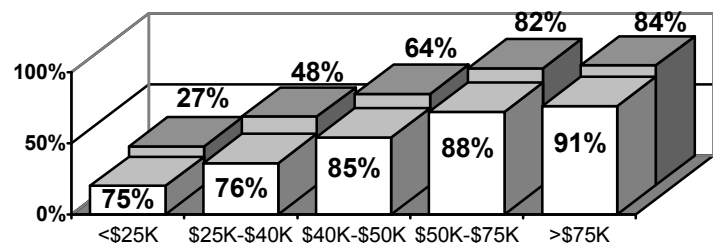


Another factor affecting weak demand may be a lack of exposure to the advantages of a high-speed connection. Forty percent of the respondents who say they are satisfied with their slower, dial-up connection also say they have no experience with a high-speed Internet connection (Appendix C, cross comparison, #16 and 18).

Household Income and Adoption

Household income has a positive correlation with adoption rates. Only 27 percent of households with incomes up to \$25,000 have a personal computer. However, of those who do, 75 percent are connected to the Internet.

Income, Computers and Connectedness

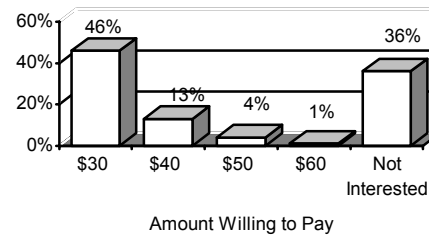


□ Percentage of Computer Owners Connected to the Internet
 ■ Percentage of Respondents Who Own a Computer

Household Willingness to Pay

Of respondents with a dial-up Internet connection, 93 percent are paying \$35 or less for Internet service (see Appendix C, #13). Thirteen percent are paying for a dedicated line (Appendix C, #14). Eighty-two percent are either not interested or would not pay more than \$30 for high-speed service.

Dial-Up Respondents' Willingness to Pay for High-Speed



Household Satisfaction with Connections

Sixty-five percent of respondents with dial-up service are satisfied with the speed of their connection, compared to 82 percent satisfaction among those with high-speed.

Are you satisfied with the speed of your Internet connection?

RESPONSE	PERCENT OF THOSE WITH	
	DIAL UP	HIGH SPEED
Yes	65%	82.2%
No	35%	11.3%
Don't know	0%	6.5%
TOTAL	100%	100.0%

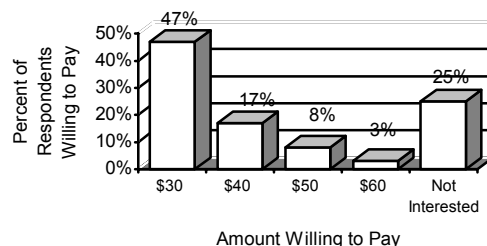
Small Business Adoption Rates

Seventy-two percent of rural Illinois small businesses have at least one working computer at their business (Appendix D, #1). Of those, 73 percent have at least one computer at their business that is connected to the Internet (Appendix D, #5). Forty percent have more than one computer connected to the Internet (Appendix D, #6).

Small Business Willingness to Pay

Of the small business survey respondents who have a dial-up connection, more than two thirds said they either are not interested or would not pay more than \$30 per month to upgrade to high speed.

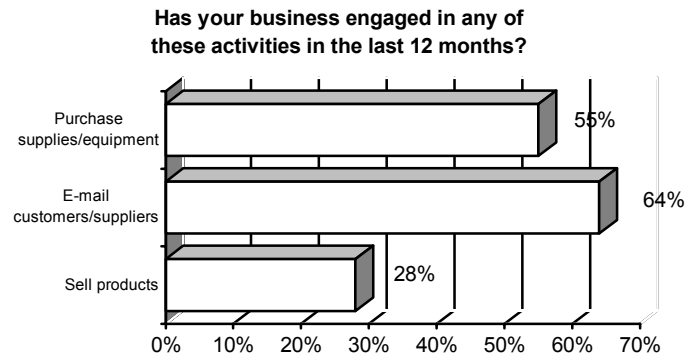
Dial-Up Business Respondents' Willingness to Pay for High-Speed



Small Business Internet Use Patterns

Sixty-six percent of connected business respondents have more than one employee using a computer while it is connected to the Internet (Appendix D, #8). The businesses have someone at their business on-line an average of 13.4 hours per week (Appendix D, #9).

Of those on-line, only 28 percent are selling their products and/or services through a web site, but 64 percent are corresponding with their customers and suppliers via e-mail, and 55 percent are purchasing supplies and equipment on-line.



Small Business Internet Technology

Of rural Illinois small businesses connected to the Internet, 27 percent have a high-speed connection and 75 percent have a dial-up connection (Thirteen respondents have more than one type of connection).

How are you connected to the Internet at your place of business? [Check all that apply.]

a dial-up connection	74%
a high-speed DSL connection	14%
a high-speed cable modem connection	5%
a high-speed wireless connection	8%
I do not know how my business is connected to the Internet	8%

Small Business Demand

Thirty-eight percent of dial-up respondents who could purchase high-speed service have chosen not to for their business. Of those, 62 percent have never experienced a high-speed Internet connection.

Small Business Satisfaction

Of rural Illinois small business respondents who are connected to the Internet, 56 percent of those with a dial-up connection are satisfied with the speed of their connection, and 89 percent of those with a high-speed connection are satisfied.

Are you satisfied with the speed of your Internet connection?

RESPONSES	PERCENT OF THOSE WITH	
	DIAL-UP	HIGH SPEED
Yes	56%	89%
No	42%	7%
Don't know	2%	4%
TOTAL	100%	100%

Examples of Current Efforts to Speed Deployment

The Illinois Community Technology Fund

The Illinois Community Technology Fund was designed to ensure that citizens in rural communities and low-income areas of Illinois have access to advanced telecommunication technology. The fund was established in 1999 by the Illinois Commerce Commission as a condition of the merger of SBC and Ameritech Illinois. It may be used by community organizations to acquire computer equipment, software, Internet access, technical support, program design and other telecommunications services. SBC/Ameritech is required to support the fund through payments of \$1 million each year for three years. In 2001, 40 communities received grants (Illinois Community Technology Fund 2000).

The Digital Divide Fund

House Bill 2900 for Section 13-301.2 of the Public Utilities Act requires the Illinois Commerce Commission to implement a rule requiring each telecommunications carrier to solicit, collect, and remit voluntary contributions to assist in the funding of the program to foster elimination of the Digital Divide (Illinois Commerce Commission 2001).

Universal Service Fund

The Universal Service Fund is collected from telecommunications providers to equalize consumer costs of service among urban and rural markets.

"The goals of Universal Service, as mandated by the 1996 Act, are to promote the availability of quality services at just, reasonable, and affordable rates; increase access to advanced telecommunications services throughout the Nation; advance the availability of such services to all consumers, including those in low income, rural, insular, and high cost areas at rates that are reasonably comparable to those charged in urban areas. In addition, the 1996 Act states that all providers of telecommunications services should contribute to Federal universal service in some equitable and nondiscriminatory manner; there should be specific, predictable, and sufficient Federal and State mechanisms to preserve and advance universal service; all schools, classrooms, health care providers, and libraries should, generally, have access to advanced telecommunications services; and finally, that the Federal-State Joint Board and the Commission should determine those other principles that, consistent with the 1996 Act, are necessary to protect the public interest" (FCC 2002).

Illinois Century Network

The Illinois Century Network is a telecommunications backbone providing high-speed access to data, video, and audio communication in Illinois schools and libraries, at colleges and universities, to public libraries and museums, and for local government and state agencies. (See appendix.) Much like our highway system, this infrastructure investment is essential to meet a major public need which would not be profitable for the private sector at this point in time. As the network matures, it is likely that the private sector will fund an increasing share of the cost (Illinois Century Network 2002).

The Illinois Virtual High School Program

The Illinois Virtual High School Program utilizes the Illinois Century Network to provide students, teachers, and communities with distance learning opportunities not available through traditional classroom instruction (Tscheschlok 2001).

Alliance Library System

The Alliance Library System is a 300-member library system in west central Illinois. Through a state grant, it now has a classroom-on-wheels training van that uses wireless Internet technology to provide technology training in west central Illinois communities (Tscheschlok 2001).

Government Regulations, Deregulations, and Requirements

The Federal Communication Commission has been reconsidering regulations put in place originally to control monopolies. The objective is to remove barriers to competition among broadband technologies, i.e., telephone, cable, satellite and wireless, in order to speed deployment and encourage innovation.

Recently proposed changes in rules governing access to spectrum bands are intended to free wireless technology developers and providers to improve wireless technologies and applications. This may eventually aid providers in reaching remote rural areas.

Marketing Innovations

Bundling of telecommunications products and services, through joint ventures, in order to provide customers competitive products and discounts is a way to add value to existing products and entice consumers into trying new technologies. Some examples of this strategy include:

- offering DSL internet services with digital satellite television to provide customers an alternative to cable TV/internet service,

- offering discounts on various package combinations of Internet service, web hosting, technical support, and local/long distance phone service.

Designed for on-the-go consumers and business travelers, EarthLink Wireless High Speed provides subscribers software that "sniffs" the nearest available fixed wireless signals for Internet access at speeds of up to 11 megabits per second.

Some churches and grain elevators are leasing space on the tops of their buildings for fixed wireless transmission equipment to serve their communities.

Community Initiatives

The National Regulatory Research Institute is compiling information about communities that have successfully acquired broadband services, including advice for communities who would like to start similar projects. The database is searchable and, upon inquiry, eleven Illinois projects surfaced. Among the eleven projects, nine of the communities describe their region as rural and/or remote. Eight of the communities procured fixed wireless Internet service, rather than satellite, DSL, or cable. Eight used private funding to purchase the equipment. Five of the communities reported that their new services would be serving less than 10,000 customers and four communities less than 1,000 customers. The community projects affected residents of the Illinois counties of Clark, Cumberland, Effingham, Grundy, Kane, Logan, McHenry, and McLean. (National Regulatory Research Institute 2001)

Computer Systems Policy Project (CSPP) Readiness Guide

The CSPP Readiness Guide is a self-assessment tool designed to help communities determine how prepared they are to participate in the networked world. It facilitates the first step of understanding where they are and provides a vision of where they need to be to reap the benefits of being connected. It also identifies actions that enable communities, governments, businesses, schools, community groups, and citizens, to benefit from being as connected as possible (The CSPP Readiness Guide 1998).

Recommendations

Continue to Educate Consumers

The Illinois Century Network is creating high-speed Internet access points at which rural residents can learn about the educational, social, and economic advantages of the information superhighway. These public schools, libraries, community colleges, universities, and museums can be used to introduce communities to advanced services, if combined with programming that is meaningful to their residents and business people.

The development and offering of training programs that fit the specific needs and interests of a particular community may stimulate the weak interest identified in the survey of rural Illinois households and small businesses.

As young people experience broadband in their schools, they can be recruited to share what they have learned with others in their communities, i.e., parents, grandparents, neighbors.

Businesses can sponsor internship programs for college students (studying information systems technologies and management information systems) to train business owners, managers, and employees on e-business applications that will allow them to become more productive and competitive.

Encourage Communities to be Proactive

There are many examples of communities that have successfully acquired broadband service for their area. Digital Divide funding should be set aside to assist or support community-initiated needs assessments, strategy/planning development, and implementation.

A couple of valuable research reports recently issued by the Illinois Institute for Rural Affairs outline very insightful recommendations for communities that would like to organize to upgrade their telecommunications infrastructure.

- Initiate or improve access to technology at public facilities, such as schools, libraries and community centers in order to introduce it to interested community members.
- Involve an active government agency that can provide resources and influence policies.
- To aggregate demand, take a regional approach and form public-private partnerships (Tscheschlok 2001).

- Establish a telecommunications council of public and private sector representatives and youth, to monitor needs, evaluate efforts, and update plans.
- Conduct annual meetings to inform residents of telecommunications accomplishments and the benefits.
- Conduct an inventory of your area's telecommunications infrastructure to identify strengths and weaknesses and to develop plans for future.
- Involve your telecommunications providers in economic development.
- Develop information technology and telecommunications educational opportunities at the high school and college levels.
- Develop a public policy agenda for improved telecommunications services for your region and state.
- Seek government and private grants for telecommunication-related projects.
- Learn as you go and don't worry about making mistakes (Beatty 2001).

Continue to Monitor Availability and Adoption

The progress of deployment and adoption of broadband Internet services in rural Illinois is subject to many influences: demographics, the economic strength of the providers serving the area, new technologies that make it easier to reach remote areas, new applications that stimulate demand, the educational and economic development objectives of a community, and the community's capacity to organize and solve problems.

Today's assessment of rural Illinois broadband market most likely will be outdated in less than a year. In order to keep programs and policies effective, policy makers and providers must have regular, up-to-date assessments of availability and demand.

This study includes an informal assessment of broadband services of rural providers. A more thorough, baseline measurement of provider offerings is recommended, with yearly follow-up surveys to coincide with follow-up consumer studies.

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